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ABSTRACT OF THE DISCLOSURE

A method of forming gate dielectric layers with various thicknesses on a substrate. At least a first active region and a second active region are provided on the substrate. A first thermal oxide layer is formed on the substrate. A blanket dielectric layer with a first thickness is deposited overlying the substrate. The dielectric layer and the underlying first thermal oxide layer on the second active region are removed to expose the substrate. A second thermal oxide layer with a second thickness less than the first thickness is formed on the second active region. A first gate is formed on the dielectric layer on the first active region and a second gate is formed on the second thermal oxide layer on the second active region.